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Jabaloya aragonensis n. gen., n. sp.
(Crustacea, Decapoda, Mecochiridae) and
Cedrillophia jurassica n. gen., n. sp.
(Crustacea, Decapoda, Glypheidae) from the
Upper Jurassic of Teruel Province (Aragón, Spain)

Abstract – Decapod macrurans from the Upper Jurassic are reported from Jabaloyas and Cedrillas villages (Teruel, Aragón). The studied specimens have been ascribed to the infraorder Astacidea Latreille, 1802, including *Jabaloya aragonensis* n. gen., n. sp. (Mecochiridae Van Straelen, 1925) and *Cedrillophia jurassica* n. gen., n. sp. (Glypheidae Zittel, 1885). The new taxa enlarge the knowledge of the macruran fauna from the Jurassic of Spain.

Key words: Crustacea, Decapoda, Upper Jurassic, Spain.

Resumen – *Jabaloya aragonensis* n. gen., n. sp. (Crustacea, Decapoda, Mecochiridae) y *Cedrillophia jurassica* n. gen., n. sp. (Crustacea, Decapoda, Glypheidae) del Jurásico superior de la provincia de Teruel (Aragón, España).

Se describe un conjunto de decápodos macruros del Jurásico superior, recuperado de las poblaciones de Jabaloyas y Cedrillas, ambas en la provincia de Teruel (Aragón). Los nuevos registros se adscriben a la infraorden Astacidea Latreille, 1802 e incluyen *Jabaloya aragonensis* n. gen., n. sp. (Mecochiridae Van Straelen, 1925) y *Cedrillophia jurassica* n. gen., n. sp. (Glypheidae Zittel, 1885). Los nuevos taxones amplian el conocimiento de la escasa fauna de macruros descrita hasta ahora en el Jurásico español.

Palabras clave: Crustacea, Decapoda, Jurásico superior, España.

Riassunto – *Jabaloya aragonensis* n. gen., n. sp. (Crustacea, Decapoda, Mecochiridae) e *Cedrillophia jurassica* n. gen., n. sp. (Crustacea, Decapoda, Glypheidae) del Giurassico superiore della Provincia di Teruel (Aragona, Spagna).

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Vengono descritti dei crostacei decapodi del Giurassico superiore rinvenuti presso i villaggi di Jabaloyas e Cedrillas (Teruel, Aragona). Gli esemplari studiati sono stati attribuiti all'infraordine Astacidea Latreille, 1802 che comprende *Jabaloya aragonensis* n. gen., n. sp. (Mecochiridae Van Straelen, 1925) e *Cedrillozia jurassica* n. gen., n. sp. (Glypheidae Zittel, 1885). Questi nuovi generi approfondiscono le conoscenze della fauna a macruri del Giurassico della Spagna.

Parole chiave: Crustacea, Decapoda, Giurassico superiore, Spagna.

Introduction and geological setting

The presence of macrurans in the Jurassic of Spain is poorly mentioned in literature, and based on a single, incomplete specimen (Solé & Via, 1989). From the marine deposits of the upper Oxfordian, north to the Jabaloyas village (Province of Teruel) (Fig. 1), several specimens preserved in nodules were collected by the geologist Sixto Fernández during some field works in the 70s and were housed in the Museu Geològic del Seminari Conciliar of Barcelona. The layers consist of limestones and interbedded marly beds yielding the concretions with crustaceans, both levels being considered to belong to the Yatova Formation (Soria & Pérez, 2002). The deposits are characterized by abundant sponges within the limestones and isolated and well-preserved macrofauna in marls, mainly poriferans, and less common ammonoids and brachiopods.

A single carapace assigned here to the family Glypheidae, was recovered near the village of Cedrillas (Province of Teruel) (Fig. 1) from limestones with scarce macrofauna (mollusc remains). The marine deposits are constituted by massive micritic limestones, and corresponds to an Upper Kimmeridgian-Portlandian interval, *Everticyclammina virguliana* zone, *Retrocyclammina arrabidensis* and *chouberti* subzones (Felgueroso & Ramírez, 1971).

Previous records of Jurassic macrurans from Spain

The specimens of macrurans from the Jurassic of Spain are very rare. Dupuy & Revilla (1956) reported only one specimen of glypheids from the Upper Jurassic of Bunyol (Foia de Bunyol, Valéncia) ascribed to “*Glypha*” *serratosai* (Museum of IGME of Madrid).

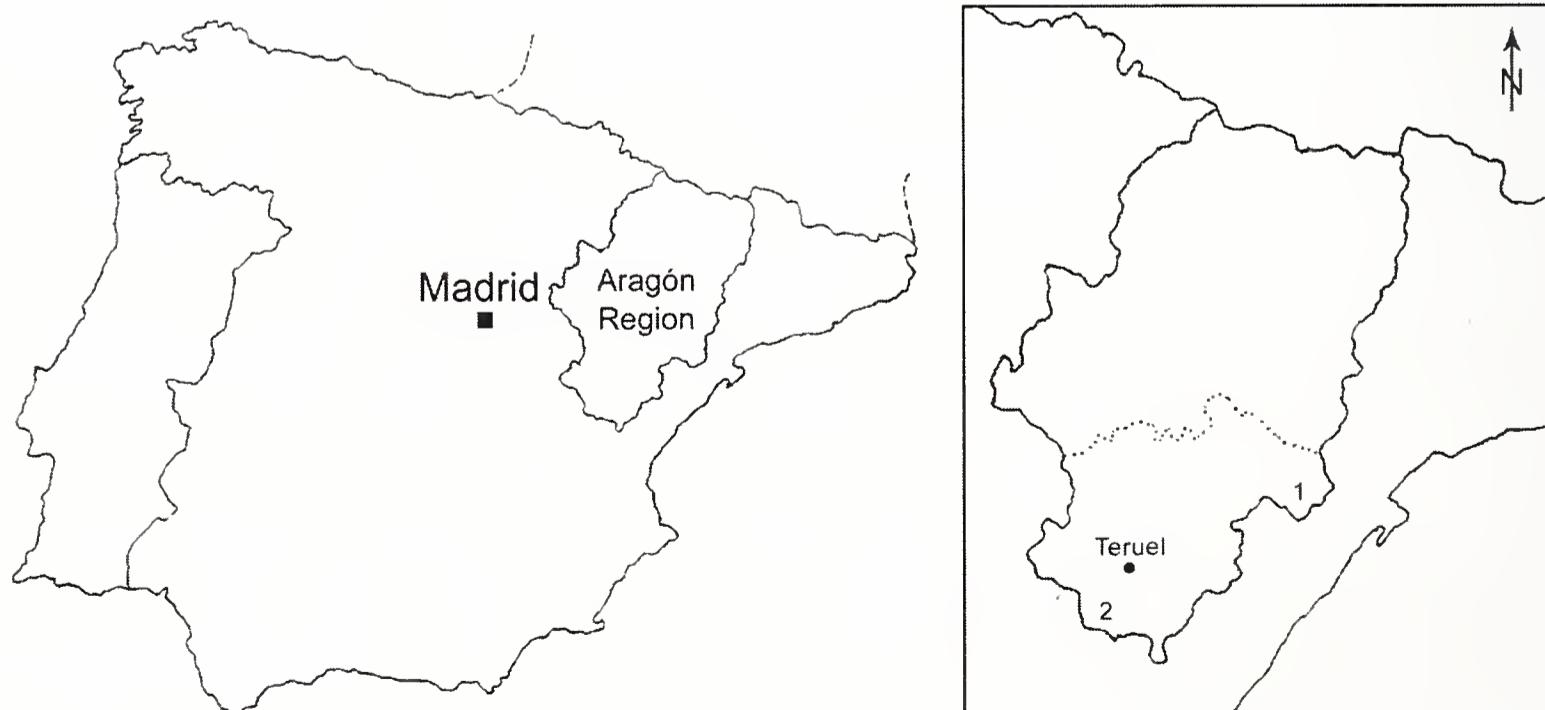


Fig. 1 – Geographic map with the fossiliferous localities. / Cartina geografica con le località fossilifere.
1) Cedrillas. 2) Jabaloyas.

Material

The studied sample includes twelve fragmentary and articulated specimens, housed in the Museu Geològic del Seminari Conciliar of Barcelona (MGSB). The specimens are three-dimensionally preserved in non calcareous nodules. Their preparation was difficult as a result of the induration of the surrounding matrix. The studied specimens are ascribed to *Jabaloya aragonensis* n. gen., n. sp. (eleven specimens) and *Cedrillosia jurassica* n. gen., n. sp. (one specimen).

Abbreviations

P1, first pereiopod; a1-a6, abdominal segments.

Systematic Palaeontology

Infraorder Astacidea Latreille, 1802

Superfamily Glypheoidea Zittel, 1885

Family Mecochiridae Van Straelen, 1925

Included fossil genera: *Mecochirus* Germar, 1827; *Meyeria* McCoy, 1849; *Pseudoglyphea* Oppel, 1862; *Huhatanka* Feldmann & West, 1978.

Genus *Jabaloya* nov.

Diagnosis: carapace subcylindrical, laterally compressed; rostrum short; anterior part of carapace with one longitudinal ridge, running medially; cervical groove deep, strongly inclined; postcervical and branchiocardiac grooves parallel strongly inclined; postcervical groove weak; branchiocardiac groove deep; hepatic groove prominent, deeply incised, strongly curved postero-ventrally; uropodal exopod with diaeresis.

Etymology: from the small village of Jabaloyas where the studied specimens were discovered.

Type species: *Jabaloya aragonensis* n. sp.

Description: as for the type species.

Discussion. At present Mecochiridae includes four fossil genera from the Upper Triassic to Upper Cretaceous. As argued by Förster (1978), Feldmann & West (1978) and Feldmann *et al.* (1995), orientation and relative development of the main carapace grooves, carapace and abdominal ornate, and length of P1 are the useful morphological characters for the identification of each genus. Therefore, *Jabaloya* n. gen. cannot be assigned to four mecochirid genera (Fig. 2). Even though the orientation and development of the main carapace grooves and a strongly reduced gastric region share *Jabaloya* n. gen. with *Mecochirus* Germar, 1827, and *Meyeria* McCoy, 1849, the prominent, postero-ventrally, strongly curved hepatic groove, and the presence of only one median longitudinal ridge cutting in two equal parts the gastric region distinguish the new genus from the others. Different is instead the orientation of the main carapace grooves between *Jabaloya* n. gen. and *Pseudoglyphea* Oppel, 1862. Moreover, the development of the gastric region is different: reduced in the new genus and wide in *Pseudoglyphea*. Finally, the absence of branchiocardiac groove and a wide gastric region distinguish *Huhatanka* Feldmann & West, 1978, from the new genus.

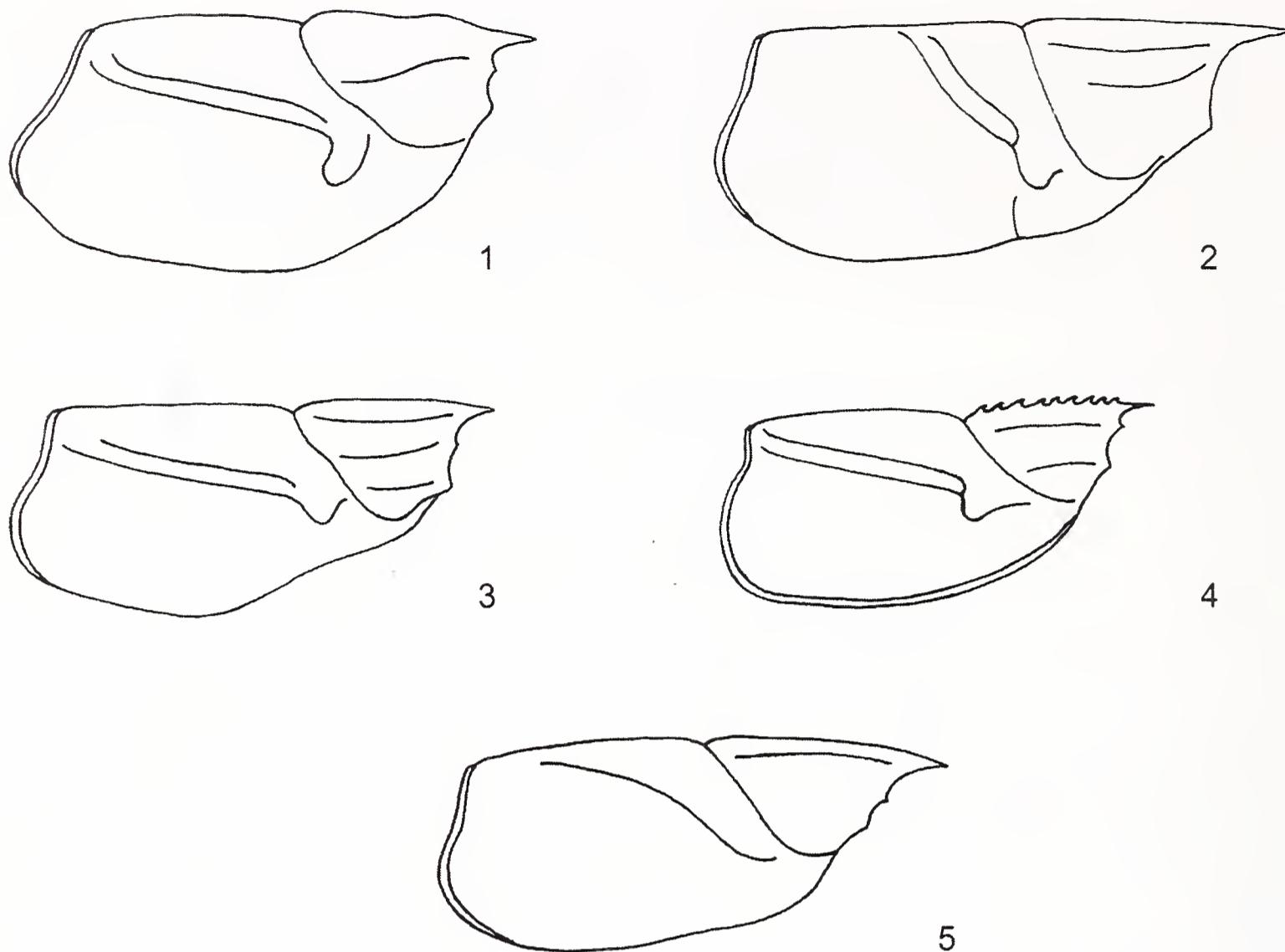


Fig. 2 – Comparison among the carapaces of the genera belonging to Mecochiridae and the carapace of the new genus. / Confronto tra i carapaci dei generi della famiglia Mecochiridae e il carapace del nuovo genere. 1) *Jabaloya* n. gen. 2) *Pseudoglyphea* Oppel, 1862. 3) *Mecochirus* Germar, 1827. 4) *Meyeria* McCoy, 1849. 5) *Huhatanka* Feldmann & West, 1978. Out of scale.

Jabaloya aragonensis n. sp.
Figs. 2-6

Diagnosis: as for the genus.

Etymology: the trivial name alludes to Aragón Region where the studied specimens were discovered.

Holotype: MGSB 74517.

Paratypes: MGSB 56544 a, b.

Type locality: Jabaloyas (Teruel, Aragón).

Geological age: Upper Jurassic (upper Oxfordian).

Material and measurements: eleven fragmentary and articulate specimens in lateral view; length of carapace between 30 and 40 mm. MGSB 56554 a, b, c, d, e, f, g, h, i, 56555 a-b (part and counter-part), 74517. Thoracic and abdominal appendages not preserved.

Description: medium-sized mecochirid with exoskeleton strongly tuberculate.

Carapace. Carapace with dorsal margin nearly inflated. Posterior margin with a sigmoid curve produced near posteroventral termination. Posteroventral margin strongly curved. Anteroventral margin inflated, inclined from anterior termination ventrally to near posterior termination of cephalic region where it curves strongly ventrally to join posteroventral margin. Anterior margin almost vertical. Rostrum short, smooth. Cervical groove slightly sinuous, strongly inclined, intercepting dorsal surface at an

angle of about 50° at a distance one third of total length of dorsal margin from anterior. Branchiocardiac groove strongly inclined, approaching dorsal surface at an angle of about 20° and then curving slightly dorsally to intersect the dorsal surface at an angle of about 25° . Postcervical groove strongly inclined, parallel to branchiocardiac groove for its all length. Hepatic groove prominent, strongly curved postero-ventrally. Cervical, branchiocardiac, and hepatic grooves deep, narrow, well marked. Postcervical groove weak. Cephalic region ornamented by one tuberculate lateral ridge running medially, dividing the gastric region in two equal parts. All regions ornamented by deep pits. Gastric region strongly reduced for the strong inclination of cervical groove.

Abdomen. Abdomen well developed. a1 reduced, about half as long as a2. a2 about one third longer than a3 through a5 which are of about equal length. a6 longer than the others. Tergal regions of all segments smooth, generally subrectangular, bounded on lateral sides by two deep grooves. Pleura of a2-5 strongly developed, highly ornamented. Major surface of pleura tuberculate. Ventral and lateral margins finely punctuate. Pleura of a2-5 triangular with a small spine developed on termination. Pleuron of a6 strongly triangular, pointed with smooth ventral and lateral margins. Telson subrectangular, smooth. Uropodal endopod with a median longitudinal ridge well developed for all its length. Uropodal exopod with well developed median longitudinal ridge, external margin bordered by a row of well-developed spines, the last two distal spines longer than the others. Upper margin of rounded diaeresis finely serrate with central spine longer than the lateral ones.

Cephalic appendages. Preserved only the small eye and the first article of the antennulae.

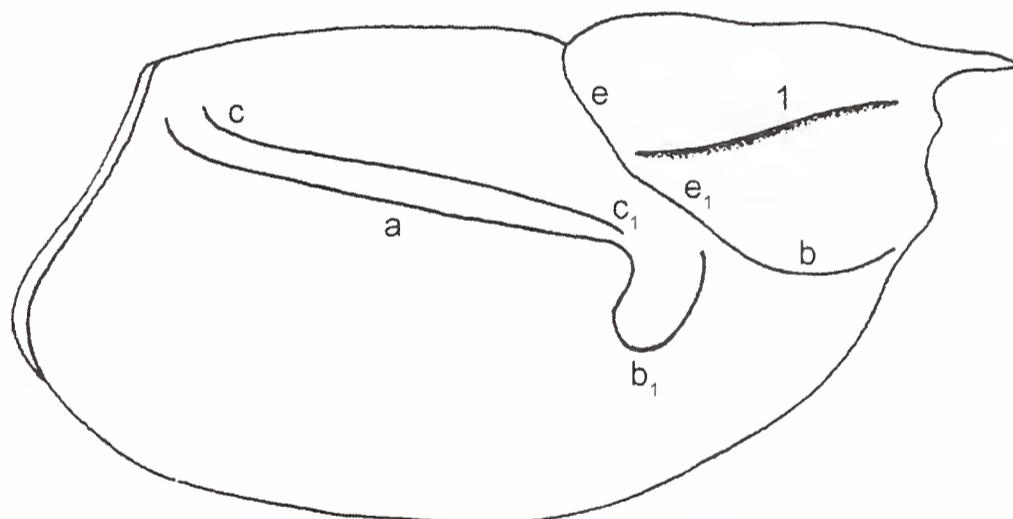


Fig. 3 – *Jabaloya aragonensis* n. gen., n. sp., carapace. 1) antennal ridge / carena antennale. a) branchiocardiac groove / solco branchiocardiaco. b) antennal groove / solco antennale. b₁) hepatic groove / solco epatico. c-c₁) postcervical groove / solco postcervicale. e-e₁) cervical groove / solco cervicale.



Fig. 4 – *Jabaloya aragonensis* n. gen., n. sp., incomplete reconstruction / ricostruzione incompleta.



Fig. 5 – *Jabaloya aragonensis* n. gen., n. sp., holotype / olotipo, MGSB 74517 (x 2.5).



Fig. 6 – *Jabaloya aragonensis* n. gen., n. sp., paratype / paratipo, MGSB 56554 c (x 3.3).

Family Glypheidae Zittel, 1885

Included fossil genera: *Glypha* v. Meyer, 1835; *Litogaster* v. Meyer, 1844; *Trachysoma* Bell, 1858; *Squamosoglypha* Beurlen, 1930; *Paralitogaster* Glaessner, 1969.

Genus *Cedrillophia* nov.

Diagnosis: carapace subcylindrical, laterally compressed; rostrum short; antennal region with one longitudinal ridge, running parallel to the anteroventral margin; cervical groove deep, steeply inclined; postcervical groove sinuous, reduced, divergent to branchiocardiac groove; branchiocardiac groove deep, having a curved V-shaped bifurcation extending in the cardiac region, directed forwards; inferior groove almost straight, deeply impressed; gastro-orbital groove curved, bifurcated, delimiting two raised lobes.

Etymology: from the small village of Cedrillas where the studied specimens were discovered.

Type species: *Cedrillophia jurassica* n. gen., n. sp.

Description: as for the type species.

Discussion. At present Glypheidae includes five fossil genera and the Recent *Neoglypha* Forest & de Saint Laurent, 1975, and *Laurentaeglypha* Forest, 2006. Among the fossil genera, there was particular confusion regards the identification of *Glypha* v. Meyer, 1835, and *Trachysoma* Bell, 1858. In fact Quayle (1987)

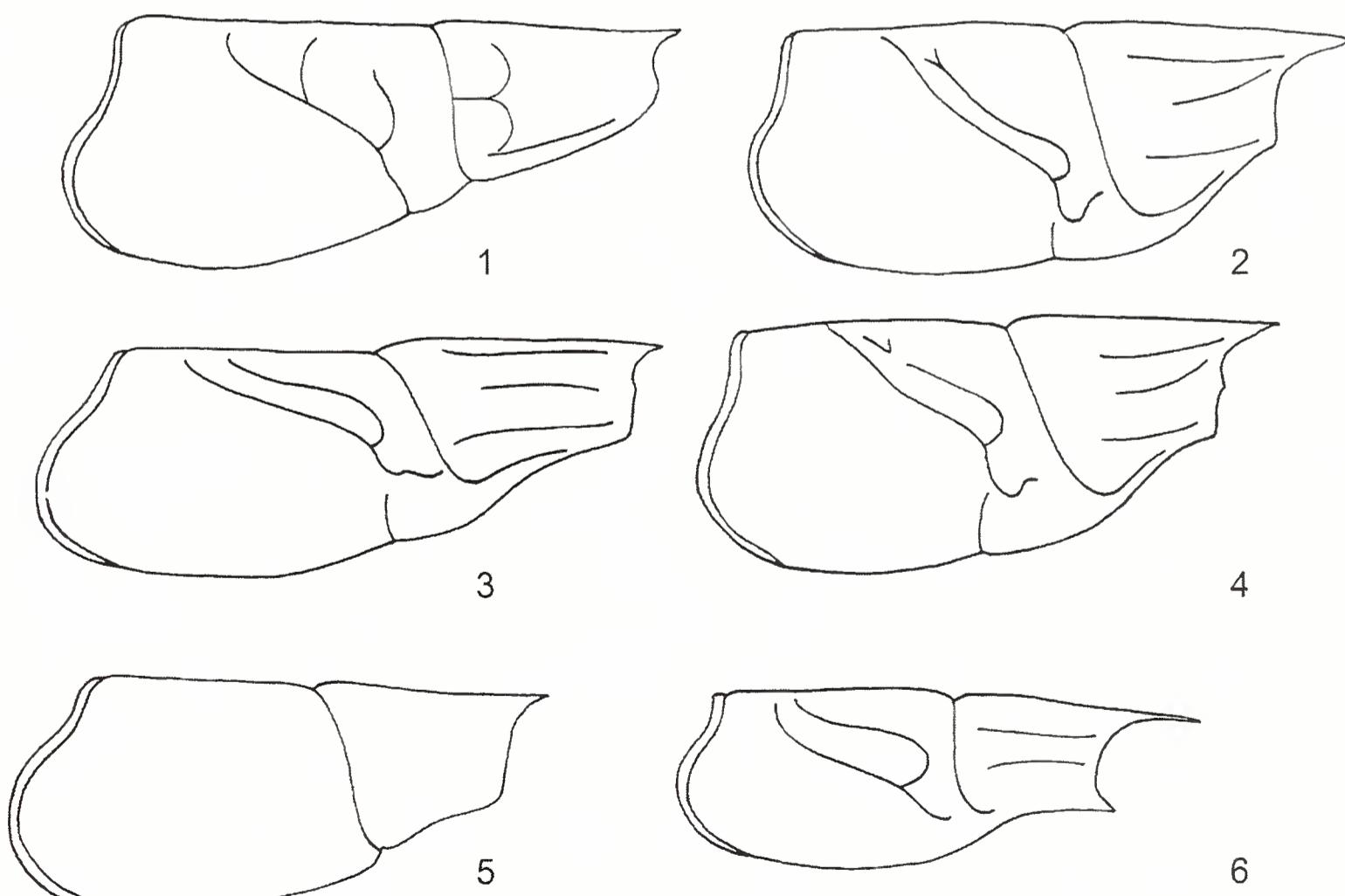


Fig. 7 – Comparison among the carapaces of the genera belonging to Glypheidae and the carapace of the new genus / Confronto tra i carapaci dei generi della famiglia Glypheidae e il carapace del nuovo genere. 1) *Cedrillophia* n. gen. 2) *Paralitogaster* Glaessner, 1969. 3) *Glypha* v. Meyer, 1835. 4) *Litogaster* v. Meyer, 1844. 5) *Squamosoglypha* Beurlen, 1930. 6) *Trachysoma* Bell, 1858. Out of scale.

considered the latter, as junior synonym of *Glyphea*. However, if we consider the orientation and relative development of the main carapace grooves as diagnostic characters to distinguish the genera of Glypheidae (Feldmann & de Saint Laurent, 2002), we must consider distinct these two genera. In fact, *Paralitogaster* Glaesner, 1969, *Litogaster* v. Meyer, 1844, and *Trachysoma* Bell, 1858, have parallel postcervical and branchiocardiac grooves, while both grooves converge posteriorly, and the postcervical groove is incompletely developed in *Glyphea* v. Meyer, 1835. The postcervical and branchiocardiac grooves are instead absent in *Squamosoglyphea* Beurlen, 1930.

If we consider valid this method to distinguish the genera of Glypheidae, the orientation and relative development of the main carapace grooves of the studied specimen do not resemble any of the above-mentioned genera for the reduced postcervical groove, not parallel to branchiocardiac groove and for the branchiocardiac groove having a V-shaped bifurcation in the cardiac region, peculiar character of the new genus (Fig. 8). Among the genera of Glypheidae, the V-shaped bifurcation of branchiocadiac groove is also present in *Glyphea*. In fact, it is the only genus in which some species such as *G. bathonica* de Ferry, 1865, *G. muensteri* (Voltz) in v. Meyer, 1840, *G. regleyana* Desmarest, 1822, *G. yoshiakii* Kato & Karasawa 2006, show this character. However, a deepened analysis reveals that the V-shaped bifurcation of the branchiocardiac groove directed forwards or backwards, is in reality an extension of postcervical groove, connected to the branchiocardiac groove by a thin unnamed groove. In the new genus, the branchiocardiac groove has a true lateral branch, extending in the cardiac region without joining to the postcervical groove. Since *Glyphea* has never been the subject of a deepened review, we could suppose the existence of two different groups of glypheids, with or without the connection between postcervical and branchiocardiac grooves. For the moment this real V-shaped bifurcation of the branchiocardiac groove, peculiar of *Cedrillossia* n. gen., is not present in any genus belonging to Astacidea.

Cedrillossia jurassica n. sp.

Figs. 7-9

Diagnosis: as for the genus.

Etymology: the trivial name alludes to the Jurassic, geological period of the studied specimen.

Holotype: MGSB 24780.

Type locality: Cedrillas (Teruel, Aragón).

Geological age: Upper Jurassic (upper Kimmeridgian-Portlandian).

Material and measurement: one complete carapace in lateral view, 30 mm long. MGSB 24780. Abdomen, cephalic and thoracic appendages not preserved.

Description: carapace with dorsal margin nearly straight. Posterior margin sigmoid, produced near posteroventral termination. Posteroventral margin gently curved. Anteroventral margin nearly straight, inclined from anterior termination ventrally to near posterior termination of cephalic region where it curves slightly ventrally to join posteroventral margin. Anterior margin almost vertical. Rostrum short, smooth. Cervical groove slightly sinuous, steeply inclined, intercepting dorsal surface at an angle of about 80° at a distance one third of total length of dorsal margin from anterior. Branchiocardiac groove oblique, approaching dorsal

surface at an angle of about 40° and then curving slightly dorsally to intersect dorsal surface at an angle of about 50° . Branchiocardiac groove having curved V-shaped bifurcation directed forwards and extending in the cardiac region. Distal part of branchiocardiac groove and lateral branch delimiting a triangular-shaped, smooth raised lobe. Postcervical groove reduced divergent to branchiocardiac groove for its all length, diverging abruptly from it ventrally to a point near the middle of carapace where it curves slightly ventrally and posteriorly to join branchiocardiac groove. Proximal part of branchiocardiac and postcervical grooves delimiting a subtriangular-shaped, smooth raised lobe. Postcervical groove then slightly curving anteriorly where it intersects almost straight inferior groove and joining ventral margin. Gastro-orbital groove curved, bifurcated, delimiting two curved raised lobes close to cervical groove. All grooves deep, narrow, well marked. Antennal region ornamented by one tuberculate lateral ridge running parallel to anteroven-tral. Branchial region ornamented with deep pits. Gastric, antennal, cardiac, hepatic, and pterigostomial regions ornamented with weak pits.

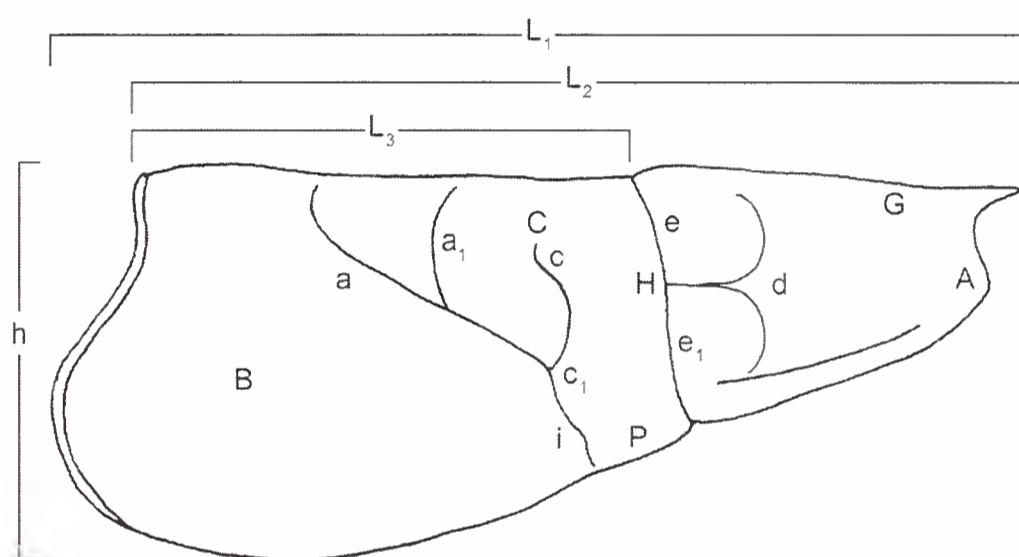


Fig. 8 – *Cedrillosia jurassica* n. gen., n. sp. L1: 30 mm. L2: 27 mm. L3: 17 mm. h: 10 mm. A) antennal region / regione antennale. B) branchial region / regione branchiale. C) cardiac region / regione cardiaca. G) gastric region / regione gastrica. H) hepatic region / regione epatica. P) pterigostomial region / regione pterigostomiale. a) branchiocardiac groove / solco branchiocardiaco. a_1) accessory branch of branchiocardiac groove / ramificazione laterale del solco branchiocardiaco. c-c₁) postcervical groove / solco postcervicale. d) gastro-orbital groove / solco gastro-orbitale. e-e₁) cervical groove / solco cervicale. i) lower groove / solco inferiore.



Fig. 9 – *Cedrillosia jurassica* n. gen., n. sp., holotype / olotipo, MGSB 24780 (x 3).

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References

- Dupuy E. & Revilla J., 1956 – Dos especies fósiles nuevas en las provincias de Valencia y Alicante. *Noticias y Comunicaciones Instituto Geológico y Minero*, 43: 5-9.
- Feldmann R. M. & Saint Laurent, M. de, 2002 – *Glyphea foresti* n. sp. (Decapoda) from the Cenomanian of Northern Territory, Australia. *Crustaceana*, Leiden, 75 (3-4): 359-373.
- Feldmann R. M., Vega F. J., García-Barrera P., Rico-Montiel R. & Martínez López L., 1995 – A new species of *Meyeria* (Decapoda: Mecochiridae) from the San Juan Raya Formation (Aptian: Cretaceous) Puebla State, Mexico. *Journal of Paleontology*, Lawrence, 69 (2): 402-406.
- Feldmann R. M. & West R. R., 1978 – *Huhatanka*, a new genus of lobster (Decapoda: Mecochiridae) from the Kiowa Formation (Cretaceous: Albian) of Kansas. *Journal of Paleontology*, Lawrence, 52 (6): 1219-1226.
- Felnegroso C. & Ramírez J., 1971 – Estratigrafía del Jurásico en la zona de Teruel- Morella (Maestrazgo). *Cuadernos de Geología Ibérica*, 2: 439-488.
- Förster R., 1978 – Die Mecochiridae, eine spezialisierte Familie der mesozoischen Glypheoidea (Crustacea, Decapoda). *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, Stuttgart, 137: 396-421.
- Quayle W. J., 1987 – English Eocene Crustacea (lobsters and stomatopod). *Palaeontology*, London, 30: 581-612.
- Solé J. & Via L., 1989 – Crustacis Decàpodes fòssils dels Països Catalans. *Batalle-ria*, Barcelona, 2: 23-42.
- Soria C. & Pérez I., 2002 – Estudio paleontológico y valoración patrimonial de los yacimientos de ammonoideos del Oxfordiense (Jurásico Superior) en la Sierra de Albarracín (Sector Terriente-Veldecuenca-Jabaloyas). *Teruel*, 88-89 (1): 135-154.

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